

Claims

What is claimed is:

- [c1] A thermally stable, substantially water-free well fluid comprising:
a polymer;
a glycol compound; and
a salt.
- [c2] The well fluid of claim 1, wherein the glycol compound comprises at least one selected from the group consisting of ethylene glycol, diethylene glycol, triethylene glycol, diethylene glycol methylether, diethylene glycol ethylether, triethylene glycol methylether, and triethylene glycol ethylether.
- [c3] The well fluid of claim 1, wherein the polymer comprises at least one selected from the group consisting of hydroxyethyl cellulose, derivatized cellulose, starch, derivatized starch, whelan gum, whelan gum derivatives, scleroglucan, scleroglucan derivatives, guar gum, guar derivatives, xanthan gum and xanthan gum derivatives..
- [c4] The well fluid of claim 1, wherein the polymer comprises ^{10 e.g.} at least one selected from the group consisting of poly(ethylene glycol), poly(diallyl amine), poly(acrylamide), poly(aminomethylpropylsulfonate), poly(acrylonitrile), poly(vinyl acetate), poly(vinyl alcohol), poly(vinyl amine), poly(vinyl sulfonate), poly(styryl sulfonate), poly(acrylate), poly(methyl acrylate), poly(methacrylate), poly(methyl methacrylate), poly(vinylpyrrolidone), poly(vinyl lactam), co-, ter-, and quater-polymers of the following co-monomers: ethylene, butadiene, isoprene, styrene, divinylbenzene, divinyl amine, 1,4-pentadiene-3-one (divinyl ketone), 1,6-heptadiene-4-one (diallyl ketone), diallyl amine, ethylene glycol, acrylamide, poly(aminomethylpropylsulfonate), acrylonitrile, vinyl acetate, vinyl alcohol,

vinyl amine, vinyl sulfonate, styryl sulfonate, acrylate, methyl acrylate, methacrylate, methyl methacrylate, vinylpyrrolidone, and vinyl lactam.

[c5] The well fluid of claim 1, wherein the salt comprises at least one selected from the group consisting of KCl, ZnCl₂, CaBr₂, and ZnBr₂, NaCl, CaCl₂, NH₄Cl, MgCl₂, NaBr, and Na₂S₂O₃.

[c6] A thermally stable, substantially water-free well fluid comprising:
a polymer;
a diol compound; and
a salt.

[c7] The well fluid of claim 6, wherein the diol compound comprises at least one selected from the group consisting of glycerol, glycerol 1,3 diglycerolate, glycerioethoxylate, 1,6, hexandiol, and 1,2 cyclohexandiol.

[c8] The well fluid of claim 6, wherein the polymer comprises at least one selected from the group consisting of hydroxyethyl cellulose, derivatized cellulose, starch, derivatized starch, whelan gum, whelan gum derivatives, scleroglucan, scleroglucan derivatives, guar gum, guar derivatives, xanthan gum and xanthan gum derivatives.

[c9] The well fluid of claim 6, wherein the polymer comprises at least one selected from the group consisting of poly(ethylene glycol), poly(diallyl amine), poly(acrylamide), poly(aminomethylpropylsulfonate), poly(acrylonitrile), poly(vinyl acetate), poly(vinyl alcohol), poly(vinyl amine), poly(vinyl sulfonate), poly(styryl sulfonate), poly(acrylate), poly(methyl acrylate), poly(methacrylate), poly(methyl methacrylate), poly(vinylpyrrolidone), poly(vinyl lactam), co-, ter-, and quater-polymers of the following co-monomers: ethylene, butadiene, isoprene, styrene, divinylbenzene, divinyl amine, 1,4-pentadiene-3-one (divinyl ketone),

1,6-heptadiene-4-one (diallyl ketone), diallyl amine, ethylene glycol, acrylamide, poly(aminomethylpropylsulfonate), acrylonitrile, vinyl acetate, vinyl alcohol, vinyl amine, vinyl sulfonate, styryl sulfonate, acrylate, methyl acrylate, methacrylate, methyl methacrylate, vinylpyrrolidone, and vinyl lactam.

[c10] The well fluid of claim 6, wherein the salt comprises at least one selected from the group consisting of KCl, ZnCl₂, CaBr₂, and ZnBr₂, NaCl, CaCl₂, NH₄Cl, MgCl₂, NaBr, and Na₂S₂O₃.

[c11] A method of treating a well comprising:

injecting a thermally stable, substantially water-free well-treating fluid into the well, wherein the well-treating fluid comprises a polymer, a glycol compound, and a salt.

[c12] The method of claim 11, wherein the glycol compound comprises at least one selected from the group consisting of ethylene glycol, diethylene glycol, triethylene glycol, diethylene glycol methylether, diethylene glycol ethylether, triethylene glycol methylether, and triethylene glycol ethylether.

[c13] The method of claim 11, wherein the polymer comprises at least one selected from the group consisting of hydroxyethyl cellulose, derivatized cellulose, starch, derivatized starch, whelan gum, whelan gum derivatives, scleroglucan, scleroglucan derivatives, guar gum, guar derivatives, xanthan gum and xanthan gum derivatives. The method of claim 11, wherein the polymer comprises at least one selected from the group consisting of poly(ethylene glycol), poly(diallyl amine), poly(acrylamide), poly(aminomethylpropylsulfonate), poly(acrylonitrile), poly(vinyl acetate), poly(vinyl alcohol), poly(vinyl amine), poly(vinyl sulfonate), poly(styryl sulfonate), poly(acrylate), poly(methyl acrylate), poly(methacrylate), poly(methyl methacrylate), poly(vinylpyrrolidone), poly(vinyl lactam), co-, ter-, and quater-polymers of the following co-monomers: ethylene, butadiene, isoprene,

styrene, divinylbenzene, divinyl amine, 1,4-pentadiene-3-one (divinyl ketone), 1,6-heptadiene-4-one (diallyl ketone), diallyl amine, ethylene glycol, acrylamide, poly(aminomethylpropylsulfonate), acrylonitrile, vinyl acetate, vinyl alcohol, vinyl amine, vinyl sulfonate, styryl sulfonate, acrylate, methyl acrylate, methacrylate, methyl methacrylate, vinylpyrrolidone, and vinyl lactam.

[c14] The method of claim 11, wherein the salt comprises at least one selected from the group consisting of KCl, ZnCl₂, CaBr₂, and ZnBr₂, NaCl, CaCl₂, NH₄Cl, MgCl₂, NaBr, and Na₂S₂O₃.

[c15] A method of treating a well comprising:

injecting a thermally stable, substantially water-free well-treating fluid into the well, wherein the well-treating fluid comprises a polymer, a diol compound, and a salt.

[c16] The method of claim 15, wherein the diol compound comprises at least one selected from the group consisting of glycerol, glycerol 1,3 diglycerolate, glycerioethoxylate, 1,6-hexandiol, and 1,2 cyclohexandiol.

[c17] The method of claim 15, wherein the polymer comprises at least one selected from the group consisting of hydroxyethyl cellulose, derivatized cellulose, starch, derivatized starch, whelan gum, whelan gum derivatives, scleroglucan, scleroglucan derivatives, guar gum, guar derivatives, xanthan gum and xanthan gum derivatives.

[c18] The method of claim 15, wherein the polymer comprises at least one selected from the group consisting of poly(ethylene glycol), poly(diallyl amine), poly(acrylamide), poly(aminomethylpropylsulfonate), poly(acrylonitrile), poly(vinyl acetate), poly(vinyl alcohol), poly(vinyl amine), poly(vinyl sulfonate), poly(styryl sulfonate), poly(acrylate), poly(methyl acrylate), poly(methacrylate),

poly(methyl methacrylate), poly(vinylpyrrolidone), poly(vinyl lactam), co-, ter-, and quater-polymers of the following co-monomers: ethylene, butadiene, isoprene, styrene, divinylbenzene, divinyl amine, 1,4-pentadiene-3-one (divinyl ketone), 1,6-heptadiene-4-one (diallyl ketone), diallyl amine, ethylene glycol, acrylamide, poly(aminomethylpropylsulfonate), acrylonitrile, vinyl acetate, vinyl alcohol, vinyl amine, vinyl sulfonate, styryl sulfonate, acrylate, methyl acrylate, methacrylate, methyl methacrylate, vinylpyrrolidone, and vinyl lactam.

- [c19] The method of claim 15, wherein the salt comprises at least one selected from the group consisting of KCl, ZnCl₂, CaBr₂, and ZnBr₂, NaCl, CaCl₂, NH₄Cl, MgCl₂, NaBr, and Na₂S₂O₃.